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UNITED STATES DEPARTMENT OF AGRICULTURE

BUREAU OF ENTOMOLOGY

FOREST INSECT INVESTIGATIONS

REPORT OF SOUTHERN OREGON PINE BEETLE SURVEYS DURING SEASON 1931 1932

(STATISTICAL REPORT NO. 9)

July, 1933.

By
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PREFACE

The present report covers the annual surveys of check sections in the southern Oregon area during the seasons 1931 and 1932. On account of difficulties in securing field assistants in 1931 only a portion of the plots were cruised in that year. With a large crew in 1932 all permanent plots were covered and the loss missed in 1931 was picked up as far as possible. The delay in cruising probably resulted in errors as to designation of the proper year of loss, but the total loss should not be greatly affected and the error is not considered a serious one.

This will be the last report in the series of "Statistical Reports of surveys on Southern Oregon-Northern California Pine Beetle Control Project Area" for the reason that the old designation of areas 1, 2 and 3 of this project is purely arbitrary and has no present significance. A large part of these areas have been cut over and the basic timber volumes greatly changed from what they were in 1921 when the estimates were started, so that the estimates of total loss by areas cannot be compared to show the fluctuation in infestation from year to year. On account of the large area cut over in the last few years, the total beetle loss in the southern Oregon area has been greatly reduced while for areas still uncut it is relatively higher than in 1921.

Moreover the losses from pine beetles extends all through the pine region of both Oregon and Washington and a general estimate of losses applicable to the region as a whole will have more value than estimates confined to one project area whose boundaries are now purely arbitrary and at present have no particular significance. Therefore these general estimates will hereafter be included in a separate series of annual reports covering forest insect conditions in the entire region.

General Statement

In connection with the Southern Oregon-Northern California Pine Beetle Control Project, check plots were established in 1921 scattered over the main ponderosa pine forests of Klamath and Lake counties. While the control project was underway 120 section plots were cruised to determine the general trend of the infestation and the need for control in different units.

After the cooperative control funds were exhausted and each agency continued control work independently such a large cruising program could not be continued and various sections were dropped. Year by year other plots have had to be dropped until at the present time only 25¼ sections are cruised annually and serve to carry forward the continuous record now covering 12 years of losses.

Purpose

The present purpose of the plot survey work is to secure a year by year record of the fluctuations in barkbeetle infestation in order to see how these epidemics are related to climatice silvicultural factors, to determine what barkbeetles actually do in the way of changing the composition of a stand over a period of years and to secure basic information on barkbeetle behavior which will serve to interpret the activities of these beetles and help to improve on present methods of handling outbreaks. Already, information of far reaching importance has been secured from the surveys and the long period of records gives a basis for conclusions which could be reached in no other way.

Methods

,Each year the check plots are cruised by a three man spotting crew using the usual survey methods. One man runs compass and maps the location of the infested trees and two spotters each cover a five chain strip in either side of the compassman.

The trees are blazed, numbered and the following data taken: Killed by, diameter b. h., number of logs, generation, Dunnings tree class. A series of increment cores from class 1 trees are also taken on each plot at intervals of several years to determine the relative yearly growth rate.

The Survey Personnel and Costs

During the past two seasons the men employed and the cost of the survey work was as follows:-

Survey of 1931

Personnel

Mr. W. J. Buckhorn in charge
Mr. Robert Noble

Period of work:-August 17-Sept. 21, 1931
Man Days-70 days
Acres cruised-4640

Cost:-

Salaries-	
Regular----	$175.00
Temporary--	105.00
Expenses------	79.19
Total	$359.19

Cost per Man Day	5.13
Cost per acre	.077

Due to the impossibility of getting field assistants in time to carry on the usual survey work, only the plots on Area 1 were cruised with the two man crew.

Survey of 1932

The survey crew of this year was augmented by two men who made a 10 percent cruise of the timber stand on all plots. Several temporary assistants were used before the men qualified under the Civil Service examination were appointed. Mr. Lynch was carried through the season through the financial assistance of the Forest Experiment Station.

Personnel:-

W. J. Buckhorn in charge
D. Lester Lynch, Temp. June 15-Sept. 17
Harry A. Fowells, " June 16-July 15
Arthur M. Young, " June 16-July 2
John M. Whiteside, Asst. Field Aide-June 24-Sept. 30
John C. Kapitke " " " June 30-Sept. 24
Thad J. Parr " " " July 22-Sept. 21

Period of Work---June 15-Sept. 30
Man Days---------485
Acres Cruised 16,160

Cost:-

Salaries	
Regular-------	$460.00
Temporary	1146.00
Expenses	724.92
Total	$2330.92

Cost per Man Day	4.80
Cost per acre cruised	.144

Resume of Past Losses

Summarizing the loss records for the 25 plots (15,520 acres) which have been cruised annually since 1921, we find the following timber losses have occurred:-

Year	Volume Killed	Percent Stand Killed
1921	2,324,030	.96
1922	2,707,920	1.12
1923	2,108,380	.87
1924	4,124,300	1.70
1925	5,918,090	2.44
1926	7,780,080	3.21
1927	6,939,000	2.86
1928	5,330,070	2.20
1929	3,581,540	1.48
1930	3,920,690	1.62
1931	5,750,430	2.37
11 yr. Total	50,484,530	20.83%

The percent of loss is based on the volume of the stand as of 1921 and the total loss of 20.83 percent is the reduction from that figure. To offset this gross loss there has been a small amount of growth which is estimated at.48% per year for the past decade or 5.28 percent for the past 11 years. Thus the net reduction in timber volume on the 25 sections has been 15.55 percent of stand or 2,430 board feet per acre. Instead of increasing or remaining stationary, all of these sections have been definitely going backwards at an average rate of 1.41 percent of the stand per year. Until this state of affairs is changed the forests in the virgin pine stands are losing ground, and require some drastic change in management if present stocks are to be maintained or increased

Recent Losses

With improvement in growth conditions in 1928, beetle damage decreased and reached a low point in 1929. Then with a continuation of drought conditions in 1929 and 1930 losses during 1930 and 1931 increased, thus starting a new epidemic cycle.

A windstorm of April 1931 threw down a vast quantity of timber throughout the pine region. This served as a breeding place for beetles and turned out a large population of beetles during the late summer and fall of 1931. This large beetle population coupled with low tree resistance resulted in heavy winter generation attacks of 1931 and a 46 percent increase of infestation over that of 1930.

The Trend of Barkbeetle Losses

As has been pointed out several times before, the trend of

barkbeetle infestation has not been uniform over the entire area represented by the sample plots, even though the growth pattern has been practically identical for the entire area.

Thus area 1 reached a high point in 1925 decreased to a low in 1928, increased slightly in 1929, dropped again in 1930 and then started up again in 1931.

Area 2 plots reached a high point in 1926, decreased steadily to a low in 1930 and then started up in 1931.

Area 3 plots reached a high in 1927, dropped suddenly to a low in 1929 and then started up in 1930.

Evidently there are a complicity of factors which determine epidemic trends, and while tree resistance is an important one, the character of the stand, the amount of recent barkbeetle losses and the action of predators all have their influence in determing the course of a beetle epidemic.

Moreover climatic factors are of prime importance as is so well illustrated by the effect of the recent low winter temperatures which destroyed a high percentage of barkbeetle broods throughout the pine region of eastern Oregon. Bark examinations from the southern Oregon territory indicate that the reduction in broods due to this freeze will average about 33 percent for Area 1, and about 80 percent for Areas 2 and 3. Surveys of this year will determine the net effect of this freeze in reducing subsequent infestation.

Control Work Conducted

During the fall of 1930 and spring of 1931, the Klamath Forest Protective Association spent $8,758.37 in treating comparatively light infestations in the Johnson Prairie Pokegama and Willow Flat Units. The Indian Service spent $8,400.31 in the fall of 1930 cleaning 13,280 acres in the Calimus Butte unit.

In the fall of 1931 and spring of 1932 the Klamath Forest Protective Association spent $3,665.29 in treating the Pokegama unit and $7,640.90 in control work on the Meryl Creek and Quartz Valley units of Area 3. The Indian Service concentrated their work on the Antelope unit and treated 1649 trees. The detailed figures are given in the following tables:-

TABLE NO. 1
LOSSES OF 1930

SUMMARY OF CRUISING DATA ON CHECK SECTIONS

Survey of 1931

Area 1

Unit	Location T	Location R	Location Sec	Acres	Volume of Stand M.B.M.	1930 Loss Total Trees Marked S	W	Trtd	Total	Total Volume Killed	Percent Stand Killed	Percent Increase (or decrease) 1930 from 1929	Date of Cruise
Aspen Lake	37S	7E	34	640	10,053	43	23	-	66	66,240	.66%	* 7%	9/7/31
Clover Sta.	38S	6E	36	640	10,754	263	262	-	525	459,490	4.26	* 5%	8/21/31
Eagle Ridge	37S	7E	16	640	10,376	57	34	-	91	90,380	.87	-33%	9/11/31
Jenny Creek	40S	4E	34	640	4,742	24	32	-	56	44,450	.94	-48%	9/2/31
Johnson Prair Rie	39S	5E	7	640	11,079	31	61	-	92	154,350	1.40	-23%	8/31/31
Klamath Cany	41S	6E	9&E	160	393	18	10	-	28	10,280	2.62	*11%	6/9/32
Pokegama	40S	5E	36	640	3,881	51	57	-	108	125,580	3.24	-12%	8/17/31
Round Lake	39S	8E	5	640	4,802	75	34	13	109	104,400	2.17	-13%	9/14/31
Totals				4640	56,080	562	513	13	1075	1,055,170	1.88%	+12%	

* Plus

TABLE NO. 2.
LOSSES OF 1930

SUMMARY OF CRUISING DATA ON CHECK SECTIONS

Survey of 1932.

Area 2.

Unit	Location			Acres	Volume of Stand M.B.M.	1930 Loss				Volume Killed	Percent Stand Killed	Percent Increase* Decrease- 1930 from 1920	Date of Cruise
	T	R	Sec.			S	N	Trtd	Total				
Antelope	36S	8E	28	640	6,435	179	72	-	251	201,380	3.13%	*48%	7/20/32
Chiloquin	35S	7E	24	640	2,914	53	34	-	87	15,480	.53	-25%	7/18/32
Ferguson	35S	13E	33	640	3,919	111	104	-	215	165,060	4.22	*10%	7/8/32
Gerber	38S	13E	24	640	4,825	115	49	-	164	129,460	2.68	-2%	8/6/32
Goodlowe	39S	13E	5	640	8,946	64	54	-	118	73,000	.82	-13%	8/9/32
Royston	38S	12E	10	640	5,620	61	68	-	129	75,320	1.34	-19%	8/4/32
Sycan	34S	12E	2	640	7,786	124	47	-	171	141,790	1.82	*13%	7/23/32
Willow Flat	37S	14E	20	640	6,065	112	77	103	292	222,640	3.67	-28%	8/1/32
Totals				5120	46,510	819	505	103	1427	1,024,130	2.20	-3%	

TABLE NO. 3
LOSSES OF 1930

SUMMARY OF CRUISING DATA ON CHECK SECTIONS

Survey of 1932

Area 3.

Unit	Location T	Location R	Location Sec	Acres	Volume of Stand M.B.M.	1930 Loss S	1930 Loss W	1930 Loss Trtd	1930 Loss Total	Volume Killed	% Stand Killed	% Increase* Decrease-	Date of Cruise
Crowder Flat	47N	11E	18	640	14,635	94	72	-	166	159,660	1.09%	*45%	8/12/32
" "	47N	12E	4	640	8,544	39	24	-	63	72,880	.85%	*44%	8/18/32
Deming Creek	36S	15E	8	640	5,371	185	124	-	309	245,810	4.57%	*11%	8/30/32
" "	36S	15E	25	640	8,046	68	51	-	119	132,660	1.65%	*3%	10/10/31
Merritt "	33S	14E	34	640	13,355	99	71	-	170	154,190	1.16%	*67%	9/12/32
Meryl Creek	36S	14E	11	640	11,418	96	191	-	287	266,150	2.33%	*74%	10/6/31
" "	35S	15E	20	640	12,132	192	98	-	290	269,330	2.22%	*165%	9/5/32
Owens	38S	15E	1	640	13,200	63	44	-	107	91,080	.69%	*100%	10/15/31
Quartz Valley	38S	17E	7&8	640	9,551	225	141	-	366	294,790	3.08%	*31%	8/20/32
Whitworth Cr	37S	16E	17	640	5,227	173	137	-	310	170,340	3.26%	-26%	8/24/32
Totals				6400	101,479	1234	953		2187	1,856,890	1.83%	*37%	

TABLE NO. 4.

ESTIMATED PONDEROSA PINE LOSSES DURING 1930

Area 1.

Unit	Acres	Sec Virgin Pine	Volume of Pine M.B.M.	Estimated 1930 Loss		Loss per Acre bd. ft.	% Stand Killed	Status
				Trees	Volume M.B.M.			
Jenny Creek	44,800	30	360,000	4,400	3,100	69	.86%	Decreasing
Johnson Prairie	44,800	22	610,000	4,000	5,600	125	.92%	Decreasing
Pokegama	51,200	35	710,000	5,000	5,000	98	.70%	Decreasing
Clover Sta	48,000	10	460,000	8,800	7,900	165	1.72%	Increasing
								Partly cut
Round Lake	19,200	12	220,000	2,000	2,000	104	.91%	Decreasing
Aspen Lake	16,000	18	270,000	2,000	1,800	112	.67%	Decreasing
Eagle Ridge	16,000	14	210,000	1,600	1,600	100	.76%	Decreasing
Chase Mt.	64,000	10	260,000	2,200	2,000	31	.77%	Cut Over
Totals								
	304,000	151	3,100,000	30,000	29,000	99	.94%	

TABLE No. 5.

ESTIMATED PONDEROSA PINE LOSSES DURING 1930

Area 2.

Unit	Acres	Sec Virgin Pine	Volume Pine M.B.M.	Estimated 1930 Loss		Loss per Acre	% Pine Killed	Status
				Trees	Volume M.B.M.			
Swan Lake (1)	48,000	15	150,000	6,000	1,200	25	.80%	Cut over
Hildebrand(2)	45,000	5	110,000	4,000	800	18	.73%	Cut over
Royston	12,000	18	100,000	2,400	1,440	120	1.44%	Decreasing
Goodlowe	12,000	10	75,000	1,600	960	80	1.28%	Decreasing
Gerber	5,700	2	25,000	1,000	700	123	2.80%	Decreasing
Willow Flat	32,000	35	255,000	9,500	7,000	219	2.75%	Decreasing
Klamath Indian Res.								
Antelope	12,000	10	210,000	3,000	2,400	200	1.14%	Increasing
Chiloquin-Sprague	27,000	8	136,000	4,500	1,350	50	1.00%	Cut over
Saddle Mt.	39,300	32	360,000	6,300	4,400	112	1.22%	Decreasing
Trout Creek	34,000	20	200,000	4,800	3,000	88	1.50%	Decreasing
Yainax	15,700	8	90,000	2,400	1,200	77	1.33%	Decreasing
Whiskey Creek	25,000	20	300,000	4,000	2,800	112	.93%	Decreasing
Bly	28,000	28	260,000	6,500	4,550	162	1.75%	Decreasing
Ferguson	11,000	7	40,000	2,000	1,400	127	3.50%	Increasing
Black Hills	37,300	40	350,000	7,000	4,900	131	1.40%	Increasing
Sycan	40,000	40	400,000	8,000	6,400	160	1.60%	Increasing
Totals	424,000		3,061,000	73,000	44,500	105	1.45%	

(1) Includes Swan, Shoner, Algoma and private land portion of Antelope units.

(2) Includes Hildebrand, Squaw Flat, and Rock Canyon units.

TABLE No. 6

ESTIMATED PONDEROSA PINE LOSSES DURING 1930.

Area 3.

Unit	Acres	Sec Virgin Pine	Volume Pine M.B.M.	Estimated 1930 Loss		Loss per Acre	% Pine Killed	Status
				Trees	Volume M.B.M.			
Crowder Flat	91,000	80	800,000	12,000	12,000	132	1.50%	Increasing
Dog Lake	174,000	140	1,360,000	16,000	14,000	80	1.03%	Increasing
Horsefly	40,000	11	90,000	3,600	1,800	45	2.00%	Decreasing
								Cut over
Owens	38,000	35	440,000	4,700	4,700	124	1.07%	Increasing
Quartz Valley	33,000	20	200,000	8,800	8,800	267	4.40%	Increasing
Whitworth	31,000	12	160,000	5,200	4,200	124	2.63%	Decreasing
Deming Creek	30,000	22	200,000	5,900	5,300	161	2.65%	Increasing
Meryl Creek	51,000	45	510,000	13,300	12,000	190	2.35%	Increasing
Merritt Creek	17,000	15	200,000	3,500	3,100	141	1.55%	Increasing
Totals	505,000	380	3,960,000	73,000	65,900	130	1.66%	

TABLE No. 7.

CONTROL WORK CONDUCTED DURING PERIOD

Fall 1930-Spring 1931

Area	Unit	Control Period	Trees Treated	Volume Trtd M.B.M.	Acres Covered	Cost	Work Done By
1	Johnson Prairie	Spring 1931	426	1146	3,000	$2,534.07	Klamath Forest
	Pokegama	" "	278		3,000		Prot. Assn.
2	Willow Flat	Fall 1930	1253	1597	8,000	$4,887.49	Klamath Forest
		Spring 1931	185	237	1,400	$1,336.81	Prot. Assn.
Klamath Indian Res	Calimus Butte	Fall 1930	2000	1744	13,280	$8,400.31	Indian Service

TABLE NO. 8.

Area 1

LOSSES OF 1931

SUMMARY OF CRUISING DATA ON CHECK SECTIONS

Survey of 1932

Unit	Location T	R	Sec	Acres	Volume of Stand M.B.M.	1931 Loss Total Trees Marked S	W	Trtd	Total	Total Volume Killed	% Stand Killed	% Increase* Decrease- 1931 fr 1930	Date of Cruise
Aspen Lake	37S	7E	34	640	9,915	64	87	-	151	158,380	1.59	*139%	7/13/32
Clover Sta.	38S	6E	36	640	10,359	421	274	-	695	562,640	6.44	*22%	6/30/32
Eagle Ridge	37S	7E	16	640	10,243	91	160	-	251	208,620	2.03	*131%	7/11/32
Jenny Creek	40S	4E	34	640	4,680	79	98	-	177	146,460	3.12	*230%	6/18/32
Johnson Prai.	39S	5E	7	640	10,848	20	91	-	111	144,130	1.32	-7%	6/23/32
Klamath Cany.	41S	6E	9SE	160	378	11	21	-	32	12,400	3.24	*21%	6/29/32
Pokegama	40S	5E	36	640	3,653	73	37	99	209	207,910	5.69	*106%	6/28/32
Round Lake	39S	8E	5	640	4,681	158	154	-	312	337,780	7.18	*223%	7/8/32
Totals				4640	54,757	917	922	99	1938	1,778,320	3.25	*73%	

TABLE NO. 9,

Area No. 2.

LOSSES OF 1931.

SUMMARY OF CRUISING DATA ON CHECK SECTIONS

Survey of 1932.

Unit	Location			Acres	Volume of Stand M.B.M.	1931 Loss				Volume Killed	% Stand Killed	% Increase* Decrease-	Date of Cruise
	T	R	Sec			S	W	Trtd	Total				
Antelope	36S	8E	28	640	6,234	214	53	220	487	414,840	6.64%	*106%	7/20/32
Chiloquin	35S	7E	24	640	2,899	66	68	-	134	41,620	1.44%	*169%	7/18/32
Fergusen	35S	13E	33	640	3,754	134	161	-	295	202,290	5.40%	*22%	7/8/32
Gerber	38S	13E	24	640	4,696	150	122	-	272	193,170	4.12%	*49%	8/6/32
Goodlowe	39S	13E	5	640	8,873	100	97	-	197	157,960	1.78%	*116%	8/9/32
Royston	38S	12E	10	640	5,545	98	147	-	245	173,930	3.14%	*131%	8/4/32
Sycan	34S	12E	2	640	7,652	43	134	-	177	163,930	2.14%	*16%	7/23/32
Willow Flat	37S	14E	20	640	5,842	90	205	-	295	213,260	3.65%	-6%	8/1/32
Totals				5120	45,495	895	987	220	2102	1,561,000	3.44%	*52%	

TABLE NO. 10.

Area No. 3

LOSSES OF 1931

SUMMARY OF CRUISING DATA ON CHECK SECTIONS

Survey of 1932

Unit	Location			Acres	Volume of Stand M.B.M.	1931 Loss					% Stand Killed	% Increase* Decrease-	Date of Cruise
	T	R	Sec			S	W	Trtd	Total	Volume Killed			
rowder Flat	47N	11E	18	640	14,476	66	117	-	183	196,430	1.36%	*23%	8/12/32
" "	47N	12E	4	640	8,471	22	34	-	56	63,610	.75%	-13%	8/18/32
eming Creek	36S	15E	8	640	5,125	327	320	-	657	524,050	10.22%	* 113%	8/30/32
" "	36S	15E	25	640	7,913	124	165	-	289	239,520	3.03%	*81%	8/27/32
erritt Creek	33S	14E	34	640	13,201	66	147	-	213	190,250	1.44%	*23%	9/12/32
eryl Creek	35S	14E	11	640	11,152	195	30	433	658	533,500	4.78%	*100%	9/8/32
" "	35S	15E	20	640	11,832	148	233	-	381	300,040	2.53%	*11%	9/5/32
wens	38S	15E	1	640	11,229	105	184	-	289	235,400	2.10%	*158%	9/15/32
uartz Valley	38S	17E	7&8	640	9,256	183	234	-	417	268,760	2.90%	-10%	8/20/32
hitworth Creek	37S	16E	17	640	5,056	181	308	-	489	276,530	5.47%	*62%	8/24/32
Totals				6400	97,711	1417	1772	433	3632	2,828,090	2.89%	*52%	

TABLE No. 11

ESTIMATED PONDEROSA PINE LOSSES DURING 1931

Area 1

Unit	Acres	Sec Virgin Pine	Volume Pine M.B.M.	Estimated 1931 Loss		Loss per Acre	% Pine Killed	Status
				Trees	Vol.M.B.M.			
Jenny Creek	44,800	30	360,000	7,300	6,500	145	1.80%	Increasing
Johnson Prairie	44,800	22	610,000	4,800	6,200	138	1.02%	Static
Pokegama	51,200	35	710,000	9,500	8,500	166	1.20%	Increasing
Clover Sta.	48,000	10	450,000	12,000	8,300	173	1.85%	Increasing
Round Lake	19,200	12	220,000	4,600	4,600	240	2.09%	Increasing
Aspen Lake	16,000	18	270,000	3,000	3,000	187	1.11%	Increasing
Eagle Ridge	16,000	14	210,000	4,000	3,600	225	1.72%	Increasing
Chase Mt.	64,000	10	260,000	4,800	3,300	51	1.27%	Increasing
Totals	304,000	151	3,090,000	50,000	44,000	145	1.43	

TABLE No. 12.

ESTIMATED PONDEROSA PINE LOSSES DURING 1931

Area 2.

Unit	Acres	Sec Virgin Pine	Volume of Pine M.B.M.	Estimated 1931 Loss		Loss per acre bd. ft.	% Stand Killed	Status
				Trees	Volume M.B.M.			
Swan Lake (1)	48,000	15	150,000	9,000	2,700	56	1.80%	Cut over
Hildebrand (2)	45,000	5	110,000	1,200	2,400	53	2.18%	" "
Royston	12,000	18	100,000	5,000	3,500	291	3.50%	Increasing
Goodlowe	12,000	10	75,000	2,900	2,300	192	3.07%	"
Gerber	5,700	2	25,000	1,200	900	158	3.60%	"
Willow Flat	32,000	35	255,000	9,000	6,300	197	2.47%	Decreasing
Klamath Indian Res.	[illegible]		[illegible]	[illegible]	[illegible]			
Antelope	12,000	10	149,000	4,500	3,800	317	2.55%	Increasing
Chiloquin-Sprague	27,000	8	136,000	3,000	900	33	.66%	"
Saddle Mt.	39,300	32	360,000	9,500	7,300	186	2.03%	"
Trout Creek	34,000	20	200,000	7,200	5,000	147	2.50%	"
Yainax	15,700	8	90,000	3,600	2,500	159	2.78%	"
Whiskey Creek	25,000	20	300,000	6,000	5,000	200	1.67%	"
Bly	28,000	28	260,000	9,700	7,600	271	2.92%	"
Ferguson	11,000	7	40,000	2,500	1,700	154	4.74%	"
Black Hills	37,300	40	350,000	10,500	8,400	225	2.40%	"
Sycan	40,000	40	400,000	8,500	7,700	192	1.92%	"
Totals	424,000	298	3,000,000	93,300	68,000	160	2.27%	

(1) Includes Swan, Shoner, Algoma, and private land portion of Antelope units.
(2) Includes Hildebrand, Squaw Flat and Rock Canyon units.

TABLE No. 13.

ESTIMATED PONDEROSA PINE LOSSES DURING 1931

Area 3.

Unit	Acres	Sec Virgin Pine	Volume Pine M.B.M.	Estimated 1931 Loss		Loss Per Acre	% Pine Killed	Status
				Trees	Volume M.B.M.			
Crowder Flat	91,000	80	800,000	19,000	19,000	209	2.38%	Increasing
Dog Lake	174,000	140	1,360,000	25,000	22,000	126	1.62%	Increasing
Horsefly	40,000	11	90,000	4,000	2,000	50	2.22%	Cut over
Owens	38,000	35	440,000	11,000	11,000	290	2.50%	Increasing
Quartz Valley	33,000	20	200,000	9,800	9,800	297	4.90%	Increasing
Whitworth	31,000	12	160,000	8,000	4,800	155	3.00%	Increasing
Deming Creek	30,000	22	200,000	9,000	6,300	210	3.15%	Increasing
Meryl Creek	51,000	45	510,000	17,000	13,500	265	2.65%	Increasing
Merritt Creek	17,000	15	200,000	4,000	3,600	212	1.80%	Increasing
Total	505,000	380	3,960,000	106,800	92,000	182	2.32%	

TABLE NO. 14.

CONTROL WORK CONDUCTED DURING PERIOD

Fall 1931-Spring 1932

Area	Unit	Control Period	Trees Treated	Volume Treated M.B.M.	Acres Covered	Cost	Work done by
1	Pokegama	Spring 1932	2017	3,777	8,160	$3,665.29	Klamath Forest Prot. Assn.
2	Antelope	Fall 1931	921	921*			Indian Service
	"	Spring 1932	728	728*			
3	Meryl Creek	Fall 1931	2160	2,993	5,200	$5,576.07	Klamath Forest Prot. Assn.
3	Meryl Creek	Spring 1932	97	117*	320	$ 200.00*	Klamath Forest Prot. Assn.
3	Quartz Valley	Spring 1932	904	1085	1400	$1,864.83	Klamath Forest Prot. Assn.

*Estimated